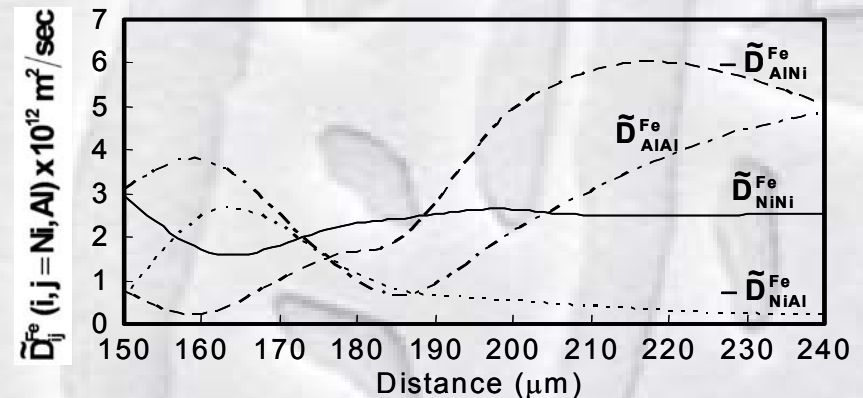


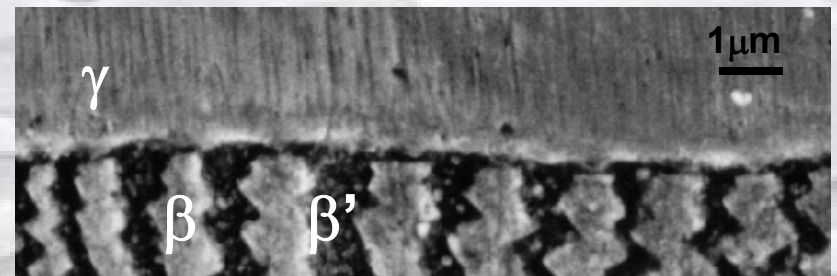
Fundamentals of Multicomponent Diffusion in Multiphase Alloys: Advances in Phenomenological Descriptions and Experimental Techniques

Yongho Sohn, University of Central Florida, DMR-0238356

Diffusion plays an important role in development and applications of materials that underpin every product and process on which our modern society depends. Mastery of diffusion phenomena in multicomponent-multiphase alloys will allow understanding and prediction of compositional and microstructural changes in materials during processing and applications. Here we present a result from a new analytical technique for the determination of composition dependent ternary interdiffusion coefficients and a novel observation of three-phase equilibrium within the diffusion zone of ternary diffusion couple.



Composition-dependent ternary interdiffusion coefficient determined by new analytical technique.



Three phase equilibrium, β (B2), β' (BCC) and γ (FCC), in a ternary diffusion couple in Fe-Ni-Al alloy annealed at 1000°C for 48 hours.

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Education and Dissemination:

- Two graduate students (Abby Lee Elliott and Nara Garimella) and two undergraduate students (Travis Patterson and Christine Cruz) contributed to this work.
- PI has completed writing a book-chapter entitled “Diffusion in Metals” for Smithells Metals Reference Book 8th Edition.
- PI has been elected as member of faculty fellow and advisory board at UCF’s Faculty Center for Teaching and Learning whose mission is to support and promote faculty in their role as teachers, researchers, scholars and community leaders.

Outreach:

With graduate and undergraduate students, PI met with representatives from Orlando Science Center (Ms. Betty Hoyer) and Center for Independence Technology Education (Ms. Karen Morehouse) to plan activities to be executed starting early 2004 for K-12 students and teachers including those with visual disability.



Orlando Science Center and Center for Independence Technology and Education